Systems Integration Division (SID)

SID Policy on Requirements Management

April 26, 2004

California Health and Human Services Agency Data Center

Revision History

REVISION	DATE OF RELEASE	PURPOSE
Initial Draft	April 26, 2004	Initial Release

Approval

CHRISTINE DUNHAM, SID ASSISTANT DIRECTOR

1 INTRODUCTION

1.1 Adoption of SID Policy

As part of its ongoing commitment to process improvement and quality within the division, the Systems Integration Division (SID) is adopting this SID Policy and Standard for Requirements Management. This policy will help clarify and enhance its current practices, continue to align the organization with the Software Engineering Institute's Capability Maturity Model (SEI's CMM), and ensure compliance with the Department of Finance (DOF) Information Technology Oversight Framework (Budget Letter 03-04, dated 7 February 2003).

1.2 Applicability

[1.2.1][1] This policy shall apply to all SID projects[2] effective the date of this policy. Projects that are in the middle of an SID life cycle process[3] (at the effective date of this policy) are required to demonstrate due diligence in complying with this policy within 30 days, to the degree that it does not jeopardize their ability to satisfy prior project commitments.

[1.2.2] The SID Assistant Director shall consider special situations for non-compliance on a case-by-case basis.

[1.2.3] Projects requesting a waiver from the requirements in this policy shall comply with the Deviation/Waiver Process (iManage SIDdocs #2484).

[1.2.4] Projects that are in the Maintenance and Operations (M&O) life cycle phase shall, at a minimum, assess and report compliance with this policy on an annual basis.

[1.2.5] All other projects shall, at a minimum, assess and report compliance with this policy at the start of a new life cycle phase.

1.3 References

The following documents were used in the creation of this policy:

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[1] Brackets [] are used as a reference designator for explicitly stated policy requirements ("shall's"). The numbers in the brackets are included in the SID Compliance Toolbox (iManage SIDdocs #2093) using a policy reference designator (e.g. PM Policy-1.2.1) for ease of verification and traceability to applicable CMM and TOSU requirements.

[2] In this document, SID Projects refer only to projects of a statewide nature (e.g. CWS/CMS, CMIPS, EBT, ISAWS, SFIS, etc.) and not to software release projects that are part of a routine Maintenance & Operations life cycle, or internally created projects and initiatives.

[3] The SID Best Practices web site defines the typical life cycle for software acquisition projects in the organization. Definitions for each life cycle phase are available at www.bestpractices.cahwnet.gov/processes.htm.

- Information Technology Oversight Framework, Budget Letter 03-04, dated 7 February 2003, Department of Finance – Technology Oversight and Security Unit.
- Software Acquisition Capability Maturity Model (SA-CMM), Version 1.02, Key Process Areas 2.3 – Requirements Development and Maintenance, April 1999, Software Engineering Institute.
- Project Management Body Of Knowledge (PMBOK), 2000, Project Management Institute (PMI).
- Institute of Electrical and Electronics Engineers (IEEE) Standard 1233-1998 (R2002) – Guide for Developing System Requirements Specifications, IEEE.
- IEEE Standard 1062-1998 (R2002) – Recommended Practice for Software Acquisition, IEEE.
- SID Policy on Project Management, iManage SIDdocs #2453, 23 February 2004, Systems Integration Division (SID).
- SID Policy on Quality Management, iManage SIDdocs #2514, TBD, SID.
- SID Policy on Configuration Management, iManage SIDdocs #2458, TBD, SID.
- Best Practices Web Site (BPweb), SID, http://www.bestpractices.cahwnet.gov.
    - Glossary and Acronyms, BPweb, SID.

1.4 Compliance Verification

[1.4.1] The SID Best Practices Support Group (BPSG) shall assess compliance to this policy at least annually using the applicable categories of the SID Compliance Assessment Toolbox (iManage SIDdocs #2093). For more information on compliance assessments, refer to the BPSG Project Plan.

1.5 Relationship To Other Policies

This policy is subordinate to the SID Policy on Project Management, and refers to the SID Policies on Quality Management and Configuration Management.

2 POLICY STATEMENT

It is the policy of SID to follow, adhere to, and implement proven project management best practices in compliance with the SEI CMM methodology, the DOF IT Project Oversight Framework, and the PMI PMBOK.

[2.0.1] Project Managers shall comply with the requirements, procedures and processes referenced in this policy document.

2.1 Required Documentation

[2.1.1] Projects shall document their specific approach to requirements management in a Requirements Management Plan in accordance with the SID Requirements Management Plan Template and associated tailoring guidance on the BP website.

[2.1.2] Projects shall update and maintain their Requirements Management Plan until the system is retired or terminated.

[2.1.3] Projects shall produce and manage a minimum set of requirements management supporting documentation with a defined hierarchical relationship in accordance with the SID Master Project Plan (MPP) Template (iManage SIDdocs #2513).

[2.1.4] Documentation related to requirements management shall be tailored and revised (as appropriate) to accommodate the differences between SID acquisition life cycle phases as defined on the BP website.

[2.1.5] The status of requirements activities shall be documented and reviewed periodically (such as at key development milestones and prior to a system release) with the project management team, quality management team, and Project Manager.

[2.1.6] The status of the requirements baseline(s) shall be documented and reviewed at least quarterly by the project management team, quality management team, and Project Manager.

[2.1.7] Measurements showing the status of requirements and requirements activities shall be documented, tracked and analyzed for trends.

Refer to the SID Policy on Quality Management for the specific metrics.

2.2 Requirements Management Roles & Responsibilities

[2.2.1] The Project Manager shall designate a specific individual as the Requirements Manager for the project.

[2.2.2] The Requirements Manager shall be responsible for implementation of this policy and for all requirements management activities, either directly or by overseeing the work of others, including the development and maintenance of the Requirements Management Plan (based on the SID Requirements Management Plan Template).

[2.2.3] Projects shall tailor their requirements management program based on the project's position in the SID Acquisition Life Cycle in accordance with the SID Requirements Management Plan Template and associated tailoring guidance.

[2.2.4] The requirements management function(s) identified in the model functional organizational chart shall be addressed in the Requirements Management Plan.

For more information, see the model organizational chart and specific roles and responsibilities on the BP website. Depending on the size and life cycle phase of the project, multiple individuals may perform a role or a single individual may perform multiple roles.

2.3 Requirements Management Training

[2.3.1] Requirements management staff shall participate in initial and refresher SID Training for Requirements Management.

2.4 Requirements Management Tools

[2.4.1] At a minimum, the Requirements Manager shall document the project and system requirements in a spreadsheet (e.g., MS Excel).

An automated tool for tracking requirements is strongly recommended, but at this time, SID has not adopted a standard requirements tool for the division.

An automated tool for computing software size estimates based on specific parameters is also recommended, but at this time SID has not endorsed a standard estimation tool for the division.

3 REQUIREMENTS MANAGEMENT METHODOLOGY

The requirements for implementing SID's requirements management methodology are defined in the subsequent sections. The methodology generally is based on IEEE Standard 1062 and 1233. The major elements of the requirements management methodology are as follows.

- Requirements Planning
- Requirements Development
- Requirements Baseline
- Requirements Change Control
- Requirements Traceability
- Requirements Verification

[3.0.1] The Requirements Management Plan shall describe or reference the specific processes and procedures that will be used to develop and manage the project requirements.

3.1 Requirements Planning

[3.1.1] The Requirements Manager shall describe in the Requirements Management Plan the project's specific approach to developing, maintaining and validating the requirements.

[3.1.2] The Requirements Manager shall initialize and populate a requirements tool to be used for managing versions/derivations of specific requirements, each requirement's status (e.g., defined, validated, closed, etc.), changes to requirements, and traceability to requirements and source documentation.

3.2 Requirements Development

[3.2.0.1] The Requirements Manager shall lead the effort to derive and document the business requirements based on input from the sponsor, users and other affected groups.

[3.2.0.2] The Requirements Manager shall use the process described in IEEE standard 1233, Guide for Developing System Requirements Specifications, to develop the requirements for the system.

[3.2.0.3] The business requirements shall form the basis and scope for the system.

[3.2.0.4] The business requirements shall be documented in a System Requirements Specification.

[3.2.0.5] Requirements shall be worded to be clear, concise, and testable.

3.2.1 Enterprise Architecture

[3.2.1.1] Where possible and cost-effective, the project shall develop system architecture requirements, which are aligned with and take advantage of the enterprise architecture of the sponsor organization, user organization and/or HHSDC.

[3.2.1.2] The system requirements document shall describe the architecture requirements for the system.

[3.2.1.3] The system design document shall describe the approach to the system architecture implementation.

3.2.2 System and Software Requirements

[3.2.2.1] The system and software requirements shall be derived from the business requirements through meetings between the project office, appropriate contractors, the sponsor and the users (such as through Joint Requirements Planning (JRP) sessions and Joint Application Design (JAD) sessions).

3.3 Requirements Baseline

[3.3.1] The Requirements Manager shall be responsible for managing the initial and subsequent business requirements baseline.

[3.3.2] The System Requirements Specification shall be baselined prior to the release of the solicitation document, and referenced or included in the solicitation document (i.e., Request for Proposal, Invitation to Partner, Statement of Work).

[3.3.3] The project shall retain approval of the system and software requirements baseline.

[3.3.4] The sponsor, user, and other affected organizations shall be involved in the review approval of requirements baselines and changes, as appropriate.

[3.3.5] System and software requirements shall be baselined prior to the start of the design effort.

3.4 Requirements Change Control

[3.4.1] Proposed changes to the baselined requirements shall be documented and analyzed for impacts in accordance with the project's change control process.

[3.4.2] Changes to requirements shall be analyzed to determine the impact to the

- Requirements baseline(s),
- Scope,
- Schedule,
- Cost,
- Contract, and
- Work currently in progress.

[3.4.3] For requirements changes that affect software, a formal software size estimation technique or tool shall be used to validate the cost and schedule impacts.

[3.4.4] When performing software size estimations, two or more approaches to estimation shall be used to refine the estimates (e.g., top-down, bottom-up, parametric).

[3.4.5] Software size estimates shall be independently reviewed for reasonableness and comprehensiveness.

The independent review may be conducted by anyone who was not involved in the development of the original estimates. Ideally the project's quality management staff or Independent Verification and Validation (IV&V) staff would perform the review.

[3.4.6] Changes to the software size estimates shall be documented and tracked, along with the date of the change, rationale for the change and the supporting data.

[3.4.7] Changes to requirements for hardware, system components (such as operating systems), and software shall be analyzed to determine the impact to the

a. System architecture and environment(s) (e.g., development, test or production environments),
b. Software,
c. Performance characteristics,
d. Maintainability of the system,
e. System resources, and
f. External interfaces.

[3.4.8] Changes to requirements shall be reviewed by the sponsor, user and other affected groups, as appropriate.

Refer to the SID Policy on Configuration Management for more on the change control process.

3.5 Requirements Traceability

[3.5.1] Bi-directional traceability of the requirements shall be maintained throughout the life of the system.

[3.5.2] Either the prime contractor or the project office may maintain the traceability information, however a separate group shall verify the traceability information periodically.

For example, if the project's systems engineering staff is maintaining the traceability information, the quality assurance staff should review the data. If the quality assurance staff is maintaining the data, then the systems engineering or IV&V staff should review the data.

[3.5.3] Traceability points shall include, at a minimum,

a. Source of Requirement (legislation, policy, user focus group, etc.)
b. Business Requirement
c. System and/or Software Requirement
d. Design Document Paragraph or Design Package Identifier
e. Integration Test Procedure
f. System Test Procedure

Where possible, traceability should be established to individual software code modules or units, and specific hardware units.

3.6 Requirements Verification and Validation

[3.6.1] Prior to accepting the system, requirements traceability shall be verified to ensure all requirements have been addressed.

[3.6.2] The sponsor and other affected organizations shall be included in the decision to accept the system and in the final signoff process.

[3.6.3] The Requirements Manager shall work with the Contract Manager to ensure all contractual requirements are tracked and verified for compliance and completion.